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EXAMINER

PATTERSON, MARC A

ART UNIT

PAPER NUMBER

1772

DATE MAILED: 05/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-15

Office Action Summary

Application No.

09/540,028

Applicant(s)

REIF ET AL.

Examiner

Marc A Patterson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-60 and 65 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-60 and 65 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

WITHDRAWN REJECTIONS

1. The 35 U.S.C 112 second paragraph rejection of Claim 20, 35 U.S.C. 102(b) rejection of Claims 20, 34 – 35 and 49 as being anticipated by Kawai (European Patent No. 0528131), 35 U.S.C. 102(b) of Claim 65 as being anticipated by Reese Jr. (U.S. Patent No. 5,667,866), 35 U.S.C. 103(a) rejection of Claims 21 – 22, 25 – 26, 28 – 33 and 36 – 41 as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese (U.S. Patent No. 4,546,880), 35 U.S.C. 103(a) of Claims 23 – 24, 27, 45 – 48 and 52 – 57 as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese (U.S. Patent No. 4,546,880) and further in view of Reese Jr. (U.S. Patent No. 5,667,866), 35 U.S.C. 103(a) rejection of Claims 42 – 44 and 60 as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese Jr. (U.S. Patent No. 5,667,866), 35 U.S.C. 103(a) rejection of Claims 49 – 51 as being unpatentable over Kawai (European Patent No. 0528131) in view of Komai et al. (U.S. Patent No. 6,238,783), 35 U.S.C. 103(a) of Claims 58 – 59 as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese (U.S. Patent No. 4,546,880) and Reese Jr. (U.S. Patent No. 5,667,866) and further in view of Clark (U.S. Patent No. 6,004,652), of record on page 2 of the previous Action, are withdrawn.

NEW REJECTIONS

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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3. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase 'connecting point' is indefinite, as it is unclear what the point connects. For purposes of examination, the phrase will be assumed mean any insert. The phrase 'to equilibrate the elastic modulus and the coefficient of thermal expansion between the plastic material and the insert' is indefinite, as the phrase is directed to a desired result, rather than to a structural limitation. The meaning of the term 'equilibrate' is also unclear. The phrase 'having a volume fraction of fibers, type of fibers, length of fibers and fiber layers so that at least one of the elastic modulus and coefficient of thermal expansion is changeable' is indefinite as the phrase is directed to a desired result, rather than to a structural limitation. It is also unclear what the claimed volume fraction of fibers, type of fibers, length of fibers and fiber layers are. For purposes of examination, the elastic modulus will be assumed to be different for the plastic and insert, and the plastic and insert will be assumed to be thermally compatible, therefore having almost the same coefficient of thermal expansion. The phrase 'changeable' is indefinite as it is unclear if the change takes place, and how the change takes place. For purposes of examination, it will be assumed that a change does not necessarily take place. The phrase 'type of fiber' is indefinite, as it is unclear what the difference in the fibers is (chemical, physical, etc.). The phrase 'are reduced' is indefinite as it is unclear what the change is reduced from. The term "abrupt" in claim 20 is a relative term which renders the claim indefinite. The term "abrupt" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 20 – 21, 25 – 26, 29, 34 – 39, 49, 52 – 57 and 65 are rejected under 35

U.S.C. 102(b) as being anticipated by Blakeley et al (U.S. Patent No. 5,118,257).

With regard to Claims 20 – 21, 25 – 26, 29, 34 – 39 and 49, Blakeley et al disclose a plastic structural element (layer of a turbine blade; column 2, lines 30 – 45) comprising a plastic material (carbon – fiber reinforced epoxy; column 4, lines 59 – 68; column 5, lines 1 – 21) and an insert having a length embedded in the plastic material and a length that projects from the plastic material (column 4, lines 59 – 68; column 5, lines 1 – 21; Figure 1); the insert exhibits a different elastic modulus from the plastic material (the insert is an aluminum alloy, and the plastic material has a sufficiently low modulus to flow; column 3, lines 44 – 51; column 4, lines 59 – 68; column 5, lines 1 – 21; column 6, lines 8 – 21) and a plastic coupling layer is arranged to join the insert to the plastic material (intermediate fiber – reinforced layer of turbine blade; column 5, lines 1 – 21); the plastic structural element and insert are thermally compatible (column 3, lines 11 – 14).

With regard to Claims 52 – 57 and 65, the embedded length has finger – like projections (undulations; the embedded length therefore has an enlarged surface area, formed by openings, which are hook – shaped anchoring elements or bends; column 5, lines 11 – 21); the fibers are

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therefore laminated into the plastic so as to anchor the insert, and are joined to the insert by a loop connection.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 22, 28, 30 – 33 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blakeley et al (U.S. Patent No. 5,118,257).

Blakeley et al disclose a plastic structural element comprising a fiber – reinforced plastic as discussed above. Blakeley et al fail to disclose a plastic having a fiber content of 45 – 60 volume percent. However, Blakeley et al disclose a plastic having a fiber content of at least 1% (the layer comprises fiber; column 5, lines 1 – 21). Therefore, the volume fraction of fiber would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end use of the product. It therefore would be obvious for one of ordinary skill in the art to vary the volume fraction of fiber, since the volume fraction of fiber would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end result as shown by Blakeley et al. *In re Boesch and Slaney*, 205 USPQ 215 (CCPA 1980).

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8. Claims 23 – 24, 27, 42 – 44, 46 – 48 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blakeley et al (U.S. Patent No. 5,118,257) in view of Reese Jr. (U.S. Patent No. 5,667,866).

Blakeley et al disclose a plastic structural element comprising a layered structure comprising carbon fiber as discussed above. With regard to Claims 23 – 24, 27, 42 – 44, 46 – 48 and 60, Blakeley et al fail to disclose a plastic structural element comprising glass fiber, and a plastic structural element comprising glass fiber and carbon fiber and a plastic structural element in which the fibers in individual layers of the structure are oriented in at least one direction, the fiber layers next to the plastic material being aligned 30 to 70 degrees relative to each other.

Reese Jr teaches that glass fiber and carbon fiber are equivalent as reinforcement for a structural element, for the purpose of forming a structural element having improved load carrying properties (column 2, lines 15 – 21). The desirability of providing for glass fiber and carbon fiber in Blakeley et al, which is a structural element, would therefore be obvious to one of ordinary skill in the art in view of Reese Jr.

Reese Jr. also teaches the orientation of fiber layers relative to each other in a layered composite (column 2, lines 22 – 38) for the purpose of forming a structural element having improved load carrying properties (column 2, lines 15 – 21). The desirability of providing for a layered composite in Blakeley et al, which is a structural element, would therefore be obvious to one of ordinary skill in the art in view of Reese Jr.

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for glass fiber in Blakeley et al in order to form a structural element having improved load carrying properties as taught by Reese Jr and to

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have provided for oriented fiber layers in Blakeley et al in order to form a structural element having improved load carrying properties as taught by Reese Jr.

With regard to Claims 42 – 44, Reese Jr. fails to disclose a coupling layer wherein the outer and inner layers of the coupling layer are aligned 30 to 70 degrees relative to each other. However, Reese Jr. discloses a coupling layer wherein the inner and outer layers of the coupling layer are oriented perpendicular (column 2, lines 22 – 38). It would have been obvious for one of ordinary skill in the art to vary the orientation of the inner and outer layers, since the orientation of the layers would be readily determined through routine experimentation by one having ordinary skill in the art depending on the desired end result. *In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980)*.

With regard to Claim 59, Reese Jr. teaches that carbon fibers and aramid fibers are equivalent in the making of a structural element (column 2, lines 5 – 10); the claimed aspect of the fibers being ‘aramide’ fibers therefore reads on Reese Jr.

With regard to Claim 60, Reese Jr fails to disclose an insert with end parts that are tapered at an acute angle which is the inverse tangent of 1:30 to 1:10. However, Reese Jr. discloses an insert with end parts that are tapered at an obtuse angle which is the inverse tangent of 1:30 to 1:10 (the core is a honeycomb structure; column 2, lines 5 – 21). It would have been obvious for one of ordinary skill in the art to vary the taper of the end parts, since the taper of the end parts would be readily determined through routine experimentation by one having ordinary skill in the art depending on the desired end result. *In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980)*.

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9. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blakeley et al (U.S. Patent No. 5,118,257) in view of Reese Jr. (U.S. Patent No. 5,667,866) and further in view of Kawai (European Patent No. 0528131).

Blakeley et al and Reese Jr. disclose a plastic structural element comprising a glass fiber and carbon fiber – reinforced composite as discussed above. Blakeley et al and Reese Jr. fail to disclose a composite having a volume fraction of fibers in the coupling layer which decreases toward the insert starting from the plastic element, and the volume fraction of glass fiber decreases toward the insert in relation to the amount of carbon fibers.

Kawai teaches a fiber – reinforced plastic structural element (fiber – reinforced composite; page 3, lines 37 – 45) having a volume fraction of glass fibers which increases toward an insert starting from the structural element (the composite has a gradient composition; page 3, lines 46 – 52) for the purpose of obtaining a composite having excellent mechanical strength (page 2, lines 5 – 9). The desirability of providing for a volume fraction of glass fibers which increases in Blakeley et al and Reese Jr, which is a plastic structural element, would therefore be obvious to one of ordinary skill in the art.

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for a volume fraction of glass or carbon fibers which increases in Blakeley et al and Reese Jr. in order to obtain a composite having excellent mechanical strength as taught by Kawai.

Kawai fails to disclose a plastic structural element wherein the volume fraction of fibers in the coupling layer decreases toward the insert starting from the plastic material. However, as stated above, Kawai discloses a plastic structural element wherein the volume fraction of fibers

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in the coupling layer increases toward the insert starting from the plastic material. Therefore, the volume fraction of fibers would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end use of the product. It therefore would be obvious for one of ordinary skill in the art to vary the volume fraction of fibers, since the volume fraction of fibers would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end result as shown by Kawai. *In re Boesch and Slaney*, 205 USPQ 215 (CCPA 1980).

10. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blakeley et al (U.S. Patent No. 5,118,257) in view of Kawai (European Patent No. 0528131).

Blakeley et al and Reese Jr. disclose a plastic structural element comprising a glass fiber and carbon fiber – reinforced composite as discussed above. Blakeley et al and Reese Jr. fail to disclose a composite having a volume fraction of fibers in the coupling layer which decreases toward the insert starting from the plastic element, and the volume fraction of glass fiber decreases toward the insert in relation to the amount of carbon fibers.

Kawai teaches a fiber – reinforced plastic structural element (fiber – reinforced composite; page 3, lines 37 – 45) having a volume fraction of glass fibers which increases toward an insert starting from the structural element (the composite has a gradient composition; page 3, lines 46 – 52) for the purpose of obtaining a composite having excellent mechanical strength (page 2, lines 5 – 9). The desirability of providing for a volume fraction of glass fibers which increases in Blakeley et al and Reese Jr, which is a plastic structural element, would therefore be obvious to one of ordinary skill in the art.

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for a volume fraction of glass or carbon fibers which increases in Blakeley et al and Reese Jr. in order to obtain a composite having excellent mechanical strength as taught by Kawai.

Kawai fails to disclose a plastic structural element wherein the volume fraction of fibers in the coupling layer decreases toward the insert starting from the plastic material. However, as stated above, Kawai discloses a plastic structural element wherein the volume fraction of fibers in the coupling layer increases toward the insert starting from the plastic material. Therefore, the volume fraction of fibers would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end use of the product. It therefore would be obvious for one of ordinary skill in the art to vary the volume fraction of fibers, since the volume fraction of fibers would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end result as shown by Kawai. *In re Boesch and Slaney*, 205 USPQ 215 (CCPA 1980).

11. Claims 50 – 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blakeley et al (U.S. Patent No. 5,118,257) in view of Komai et al. (U.S. Patent No. 6,238,783).

Blakeley et al discloses a plastic structural element comprising an insert as discussed above. With regard to Claims 50 – 51, Blakeley et al fails to disclose an insert which has an aluminum surface which is anodically oxidized and roughened at the portions receiving the coupling layer.

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Komai et al teach that it is well known in the art to anodically treat and roughen an aluminum surface prior to bonding with a thermoplastic resin layer for the purpose of obtain good adhesion (column 1, lines 28 – 65). The desirability of providing for a surface which is anodically oxidized and roughened at the portions receiving the coupling layer in Blakeley et al, which is aluminum bonded with a plastic layer, would therefore be obvious to one of ordinary skill in the art

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for anodically treating and roughening an aluminum surface prior to bonding with a thermoplastic resin layer in Blakeley et al in order to obtain good adhesion as taught by Komai et al.

ANSWERS TO APPLICANT'S ARGUMENTS

12. Applicant's arguments regarding the 35 U.S.C 112 second paragraph rejection of Claim 20, 35 U.S.C. 102(b) rejection of Claims 20, 34 – 35 and 49 as being anticipated by Kawai (European Patent No. 0528131), 35 U.S.C. 102(b) of Claim 65 as being anticipated by Reese Jr. (U.S. Patent No. 5,667,866), 35 U.S.C. 103(a) rejection of Claims 21 – 22, 25 – 26, 28 – 33 and 36 – 41 as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese (U.S. Patent No. 4,546,880), 35 U.S.C. 103(a) of Claims 23 – 24, 27, 45 – 48 and 52 – 57 as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese (U.S. Patent No. 4,546,880) and further in view of Reese Jr. (U.S. Patent No. 5,667,866), 35 U.S.C. 103(a) rejection of Claims 42 – 44 and 60 as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese Jr. (U.S. Patent No. 5,667,866), 35 U.S.C. 103(a) rejection of Claims

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49 – 51 as being unpatentable over Kawai (European Patent No. 0528131) in view of Komai et al. (U.S. Patent No. 6,238,783), 35 U.S.C. 103(a) of Claims 58 – 59 as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese (U.S. Patent No. 4,546,880) and Reese Jr. (U.S. Patent No. 5,667,866) and further in view of Clark (U.S. Patent No. 6,004,652), of record on page 2 of the previous Action, have been considered and have been found to be persuasive. The rejections are therefore withdrawn. The new 35 U.S.C. 112 second paragraph rejection of Claim 20, 35 U.S.C. 102(b) rejection of Claims 20 – 21, 25 – 26, 29, 34 – 39, 49, 52 – 57 and 65 as being anticipated by Blakeley et al (U.S. Patent No. 5,118,257), 35 U.S.C. 103(a) rejection of Claims 22, 28, 30 – 33 and 45 as being unpatentable over Blakeley et al (U.S. Patent No. 5,118,257), 35 U.S.C. 103(a) rejection of Claims 23 – 24, 27, 42 – 44, 46 – 48 and 60 as being unpatentable over Blakeley et al (U.S. Patent No. 5,118,257) in view of Reese Jr. (U.S. Patent No. 5,667,866), 35 U.S.C. 103(a) rejection of Claim 40 as being unpatentable over Blakeley et al (U.S. Patent No. 5,118,257) in view of Reese Jr. (U.S. Patent No. 5,667,866) and further in view of Kawai (European Patent No. 0528131) as being unpatentable over Blakeley et al (U.S. Patent No. 5,118,257) in view of Reese Jr. (U.S. Patent No. 5,667,866) and further in view of Kawai (European Patent No. 0528131), 35 U.S.C. 103(a) rejection of Claim 41 as being unpatentable over Blakeley et al (U.S. Patent No. 5,118,257) in view of Kawai (European Patent No. 0528131) and 35 U.S.C. 103(a) rejection of Claims 50 – 51 as being unpatentable over Blakeley et al (U.S. Patent No. 5,118,257) in view of Komai et al. (U.S. Patent No. 6,238,783) above are directed to amended Claims 20 – 60 and 65.

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Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc Patterson, whose telephone number is (703) 305-3537. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM. If attempts to reach the examiner by phone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (703) 308-4251. FAX communications should be sent to (703) 872-9310. FAXs received after 4 P.M. will not be processed until the following business day.

Marc A. Patterson, PhD.

Marc Patterson
Art Unit 1772

Harold Pyon
HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772

5/2/03